

**Remarks**

**Preliminary Matters**

Claims 1-42 are presented for reconsideration. Claims 40-42 have been added.

**Objections to Specification**

As required by the Examiner, the Specification has been amended in order to remove embedded hyperlinks. No new matter has been added.

**Rejections Under 35 U.S.C. § 102**

Claims 1-9, 11, 13-23, 25, 27-34, and 36-39 were rejected under 35 U.S.C. § 102(b) as being unpatentable over Bugnion, *Disco: Running Commodity Operating Systems on Scalable Multiprocessors*: (Bugnion (Disco)) and Bugnion, U.S. Patent No. 6,075,938 (Bugnion (Patent)).

Both Bugnion (Disco) and Bugnion (Patent) disclose a single shared memory multiprocessor that is partitioned into several virtual machines. In contrast, the claims herein are directed to a cluster of individual interconnected computers having respective memories that are aggregated into a single large virtual multiprocessor using a distributed virtual machine implementer, e.g., multiple virtual machine monitors. For example, amended independent method claim 1 recites:

. . . using a virtual machine management element to coordinate at least a first virtual machine implementer and a second virtual machine

implementer on said first computer and said second computer, using said respective memory. . .

However, the Examiner has noted the following statements in the conclusion (Sec. 7) of Bugnion (Disco) together with Fig. 1:

Although Disco was designed to exploit shared-memory multiprocessors, the techniques it uses also apply to more loosely-coupled environments such as networks of workstations (NOW). Operations that are difficult to retrofit into clusters of existing operating systems such as checkpointing and process migration can be easily supported with a Disco-like monitor. As with shared-memory multiprocessors, this can be done with a low implementation cost and using commodity operating systems.

The Examiner has interpreted this material as anticipating Applicant's claimed invention. Applicant submits herewith a Declaration under 37 C.F.R. § 1.132 to establish that:

(1) Bugnion (Disco) and Bugnion (Patent) do not disclose the claimed invention. Statements cited by the Examiner in the conclusion of Bugnion (Disco), to "more loosely coupled environments" would not be interpreted by one ordinarily skilled in the art to encompass the claimed cluster of computers organized as a single virtual multiprocessor; and

(2) Bugnion (Disco) and Bugnion (Patent) do not enable one ordinarily skilled in the art to make the claimed invention. A Patent or Printed Publication cannot anticipate if it is not enabling. In re Donohue, 766 F2d 531, 533 (Fed Cir 1985).

The Examiner makes no mention of Bugnion (Patent) in his discussion, and Applicant is unsure as to which portions of Bugnion (Patent) are being relied upon.

Dependent claims herein are believed to be allowable as pending from an allowable base claim.

**Rejections Under 35 U.S.C. § 103**

Dependent claims 10, 12, 24, 26, and 35 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Bugnion (Disco) in view of Bugnion (Patent) and further in view of Official Notice taken.

The above noted declaration under Rule 132 asserts that it would not be obvious to make the claimed invention based on the teachings of Bugnion (Disco) and Bugnion (Patent).

Dependent claims 10, 12, 24, 26, and 35 are believed to be allowable as pending from an allowable base claim.

**New Claims.**

New claims 40-42 are directed to aggregation of the individual memories of a cluster of computers into an apparent single shared memory as seen by an operating system. It is explained in the accompanying Declaration under Rule 132 that this feature is not found in the Disco design as disclosed in Bugnion (Disco) and Bugnion (Patent). Support for the claimed subject matter is found, e.g., in paragraph [0053], which states:

". . . Instructions of the guest operating system 18 are distributed for execution among the

nodes 22, 24, 26 as though the system 10 were a single SMP machine with NUMA-like shared memory.

**Concluding Matters**

It is believed that the amendments and remarks presented hereinabove are fully responsive to all the grounds of rejection and objections raised by the Examiner, and that the Application is now in order for allowance.

Applicant again thanks the Examiner for his thorough consideration of the Application and appreciates the careful analysis of the art cited therein.

Respectfully submitted,

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